

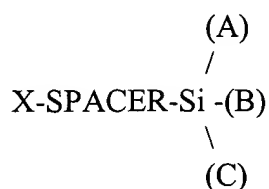
## **AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of the Claims**

1. (Currently Amended) ~~An electronically addressable microchip~~ A device comprising a plurality of ~~electronically programmable~~ microlocations:
  - wherein the microlocations each comprise an underlying working microelectrode on a substrate,
  - wherein at least some of the microelectrodes are covered by a permeation layer,
  - further wherein at at least one microlocation the permeation layer is covalently attached to the electrode by linker moieties,
  - and wherein the covalent attachment between the electrode and the linker and the permeation layer material is stable at a current density of at least ~~0.04~~ 0.10 nA/ $\mu\text{m}^2$ .
2. (Currently Amended) The ~~electronically addressable microchip~~ device of claim 1 wherein the permeation layer comprises a material selected from the group consisting of an inorganic sol-gel, a synthetic polymer hydrogel, and a carbohydrate hydrogel.
3. (Currently Amended) The ~~electronically addressable microchip~~ device of claim 1 wherein the electrode is selected from the group consisting of platinum silicide (PtSi), tungsten silicide (WSi), titanium silicide (TiSi), gold silicide (AuSi), platinum/titanium (Pt/Ti), gold/titanium (AuTi), poly(phenylene vinylene), polythiophene, and polyaniline.

4. (Currently Amended) The ~~electronically addressable microchip~~ device of claim 1 wherein the linker has the formula



wherein:

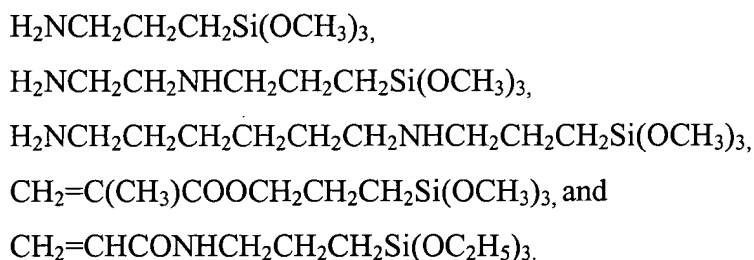
X is selected from the group consisting of acrylate, methacrylate, acrylamide, methacrylamide, allyl, vinyl, acetyl, amine, substituted amine, epoxy and thiol;

SPACER is selected from the group consisting of alkyl, aryl, mono- or polyalkoxy, ethyleneglycol, polyethyleneglycol, mono- or polyalkylamine, mono- or polyamide, thioether derivatives, and mono- or polydisulfides;

A and B are selected from the group consisting of Oxygen-R, Cl, Br, and an X-SPACER moiety, or any combination thereof, wherein R is H, alkyl, methyl, ethyl, propyl, isopropyl, and branched or linear alkyl of 4 to 10 carbon atoms; and

C is a hydrolyzable moiety selected from the group consisting of Oxygen-R, Cl, and Br, wherein R is H, branched alkyl, methyl, ethyl, propyl, isopropyl, and branched or linear alkyl of 4 to 10 carbon atoms.

5. (Currently Amended) The ~~electronically addressable microchip~~ device of claim 4 wherein the linker is selected from the group consisting of:



6-14. (Cancelled)

15. (Currently Amended) The ~~electronically addressable microchip~~ device of claim 1 wherein the permeation layer is a hydrogel comprising a material selected from the group consisting

of: agarose, glyoxylagarose, acrylamide, methacrylamide, polyacrylamide, and other synthetic polymers

16. (Currently Amended) The ~~electronically addressable microchip~~ device of claim 15 wherein the hydrogel comprises glyoxylagarose.

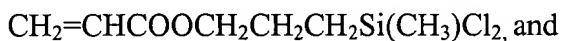
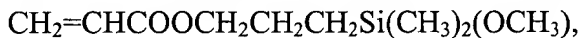
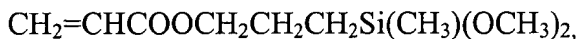
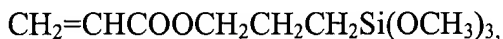
17. (Currently Amended) The ~~electronically addressable microchip~~ device of claim 15 wherein the hydrogel comprises polyacrylamide.

18. (Currently Amended) The ~~electronically addressable microchip~~ device of claim 1 wherein the electrode is a metal/silicide electrode selected from the group consisting of platinum silicide (PtSi), tungsten silicide (WSi), titanium silicide (TiSi), and gold silicide (AuSi).

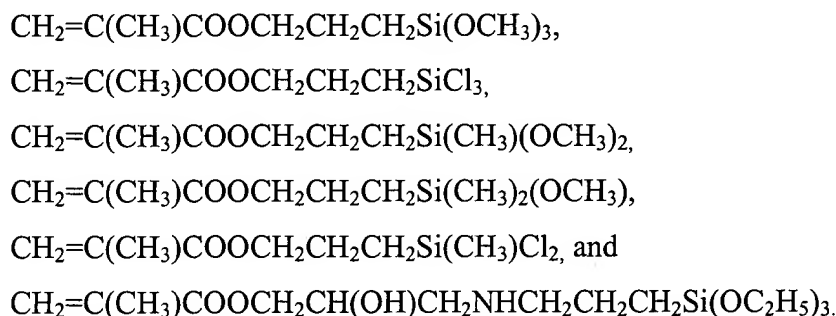
19. (Currently Amended) The ~~electronically addressable microchip~~ device of claim 1 wherein the electrode is a metal/metal electrode selected from the group consisting of platinum/titanium (PtTi) and gold /titanium (AuTi).

20. (Currently Amended) The ~~electronically addressable microchip~~ device of claim 1 wherein the electrode is an organic electrode selected from the group consisting of poly(phenylene vinylene), polythiophene, and polyaniline.

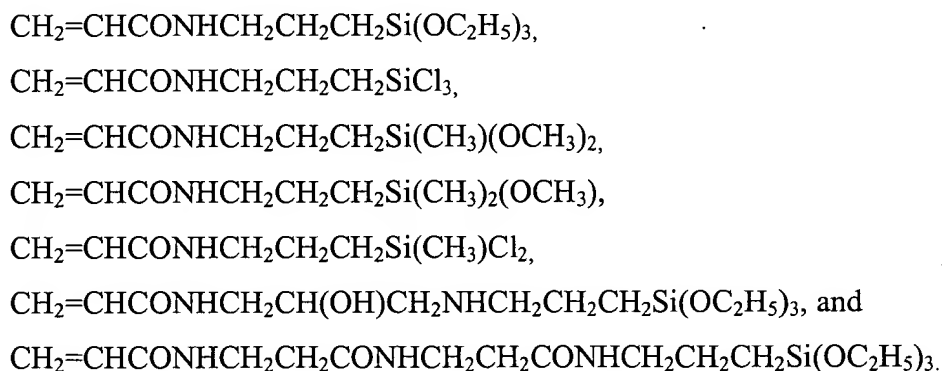
21. (Currently Amended) The ~~electronically addressable microchip~~ device of claim 4 wherein the linker is an acrylate linker selected from the group consisting of:



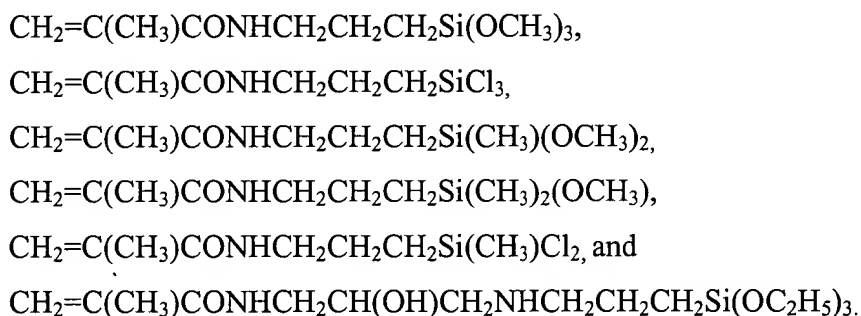
22. (Currently Amended) The ~~electronically addressable microchip device~~ of claim 4 wherein the linker is a methacrylate linker selected from the group consisting of:



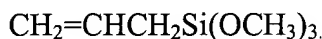
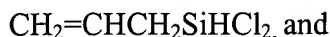
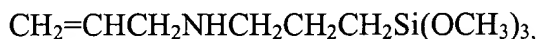
23. (Currently Amended) The ~~electronically addressable microchip device~~ of claim 4 wherein the linker is an acrylamide linker selected from the group consisting of:



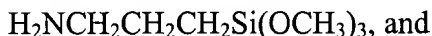
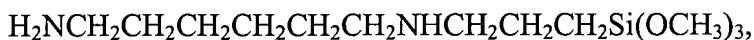
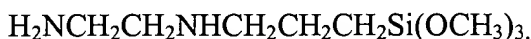
24. (Currently Amended) The ~~electronically addressable microchip device~~ of claim 4 wherein the linker is a methacrylamide linker selected from the group consisting of:



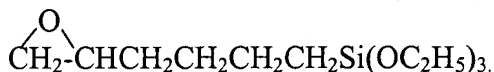
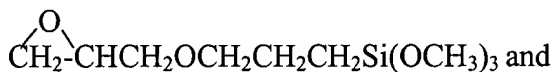
25. (Currently Amended) The ~~electronically addressable microchip device~~ of claim 4 wherein the linker is an allyl derivative linker selected from the group consisting of:



26. (Currently Amended) The ~~electronically addressable microchip device~~ of claim 4 wherein the linker is an amino derivative linker selected from the group consisting of:



27. (Currently Amended) The ~~electronically addressable microchip device~~ of claim 4 wherein the linker is an epoxy derivative linker selected from the group consisting of:



28. (Currently Amended) The ~~electronically addressable microchip device~~ of claim 5 wherein the linker is  $\text{H}_2\text{NCH}_2\text{CH}_2\text{CH}_2\text{Si}(\text{OCH}_3)_3$ .

29. (Currently Amended) The ~~electronically addressable microchip device~~ of claim 5 wherein the linker is  $\text{H}_2\text{NCH}_2\text{CH}_2\text{NHCH}_2\text{CH}_2\text{CH}_2\text{Si}(\text{OCH}_3)_3$ .

30. (Currently Amended) The ~~electronically addressable microchip device~~ of claim 5 wherein the linker is  $\text{CH}_2=\text{C}(\text{CH}_3)\text{COOCH}_2\text{CH}_2\text{CH}_2\text{Si}(\text{OCH}_3)_3$ .

31. (Canceled)

32. (Currently Amended) The ~~electronically addressable microchip~~ device of claim 1 wherein the resulting covalent attachment between the electrode and the linker and the permeation layer material is stable at a current density of at least  $0.2 \text{ nA}/\mu\text{m}^2$ .

33. (Currently Amended) The ~~electronically addressable microchip~~ device of claim 1 wherein the resulting covalent attachment between the electrode and the linker and the permeation layer material is stable at a current density of at least  $0.4 \text{ nA}/\mu\text{m}^2$ .